

# MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE, Assistant Editor: FRANK OWEN STETSON.

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## INTRODUCTION.

The MONTHLY WEATHER REVIEW for October, 1904, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph, and mail, 167; West Indian Service, cable and mail, 4; River and Flood Service, regular 43, special river and rainfall, 190, special rainfall only, 56; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 3025; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries, also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. R. C. Lydecker, Territorial Meteorologist, Honolulu, Hawaii; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander H. M. Hodges, Hydrographer, United States Navy; H. Pit-

tier, Director of the Physico-Geographic Institute, San José, Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; Rev. José Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the Meteorological Service of the Republic of Cuba.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the Review, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is  $157^{\circ} 30'$ , or  $10^{\text{h}} 30^{\text{m}}$  west of Greenwich. The Costa Rican standard meridian is that of San José,  $5^{\text{h}} 36^{\text{m}}$  west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

## FORECASTS AND WARNINGS.

By Prof. ALFRED J. HENRY, temporarily in charge of Forecast Division.

The weather over the North Atlantic during the first decade of the month was not characterized by gales of unusual character for the season, although a marked barometric depression, that was central on the 1st over the Canadian Maritime Provinces, moved slowly eastward over the Atlantic on the 2d. During the second decade of the month the disturbances which passed over the Atlantic from the North American Continent were generally without marked energy. Fresh westerly gales prevailed over the northern portion of the British Isles and to the westward over the Atlantic on the 16th and 17th, and again on the 20th and 21st. During the last decade of the month a tropical disturbance moved rapidly northeastward from the Carolina coast, where it was central on the evening of the 20th, and disappeared east of the Canadian Maritime Provinces on the 23d. Unsettled weather, with occasional moderate gales, prevailed as far south as the Azores on the 25th and 26th. The observatory at Horta reported a maximum wind velocity of 60 miles an hour from the northeast on the morning of the 26th. A disturbance evidently moved east-southeast from the Azores to the coast of Spain during the 27th, 28th, and 29th. The month closed with the advance of an area of high pressure from the American Continent, although fresh north to west gales prevailed in the vicinity of Bermuda on the morning of the 31st.

In the United States the barometric disturbances of the month were confined mostly to the northern portion of the country. With one or two exceptions, they possessed no fea-

tures worthy of mention. A shallow disturbance was noted over the Caribbean Sea as early as the 10th. It moved slowly west-northwest during the 11th and 12th, and by the morning of the 13th its northward advance was made apparent by moderate easterly winds attended by rain on the southeast Florida coast. At no time during the 10th, 11th, and 12th was the center of the disturbance near enough to any observation station to enable the officials of the Bureau to determine its intensity and probable direction. High winds set in over southern Florida on the 14th, continuing during the 15th, and attaining hurricane force on the evening of the 16th, at which time telegraphic communication with the southeast Florida coast was interrupted. On the morning of the 17th the wind at Jupiter, Fla., was blowing from the eastward with a velocity of 60 miles an hour. It increased during the day to 68 miles, and diminished rapidly during the evening. The center of the storm apparently remained stationary over southern Florida from the morning of the 17th until the morning of the 19th. It diminished greatly in energy, and during the 19th only moderate winds were experienced, except at Jacksonville, where a northeast wind of 32 miles an hour was recorded. During the night of the 20th a fresh center appears to have developed a short distance off the South Carolina coast. This new center moved rapidly north-northeast, passing Wilmington, N. C., about 3 a. m. of the 21st and Philadelphia, Pa., about 9 a. m., and disappearing over the Canadian Maritime Provinces on the evening of the 21st. In its northward course it was

attended by heavy rains in the Carolinas, Virginia, Maryland, eastern Pennsylvania, eastern New York, and New England.

The most serious accident to shipping was the foundering of the 3-masted British schooner *Melrose* off the Florida coast Saturday morning, October 15. Seven lives were lost and the survivors were without food and water nearly four days. A press dispatch from Miami, Fla., under date of October 19, gives the following additional information:

After blowing a gale Saturday and Sunday, the storm predicted for south Florida broke over this place Sunday night about midnight. In a few hours Miami and most of the towns on the east coast of Florida were cut off from communication with the outside world. Telegraph wires were blown down and the railroad tracks were obstructed, and not until to-day was communication restored. The wind attained a maximum velocity of 75 miles per hour here. The chief damage here on land was done by the rain. A few roofs were damaged and window panes blown in, so that the buildings were damaged by rain.

In the surrounding country the fruit and vegetable crops were damaged to a considerable extent.

The 4-masted schooner *James Judge*, of Philadelphia, is aground four miles south of Palm Beach, having gone ashore Monday in a terrific gale, in which the wind was blowing 60 to 90 miles an hour. The crew are all safe. The vessel is badly damaged. It carried no cargo.

The 3-masted bark *Zion*, owned by A. Hemmes, of Emden, Germany, loaded with a million feet of lumber, from Pensacola to London, stranded five miles north of the House of Refuge, near Fort Lauderdale, about 3 o'clock yesterday and Captain Hemmes and crew of fourteen men, after several hours of struggling, saved themselves with the aid of pieces of lumber and improvised rafts.

Ample and continued warnings of the approach of this storm were widely distributed along the south Atlantic and Gulf coasts. The following clipping from the Daily Metropolis, Jacksonville, Fla., dated November 5, 1904, testifies as to the efficient manner in which these warnings were distributed:

The recent tropical storm that swept the southeast portion of this State during the middle of October did not reach that section without due warning from the Weather Bureau, given five or six days before the storm approached the coast of Florida. The first notice from the Weather Bureau that a tropical disturbance was developing south of Jamaica was given out by the Central Office at Washington on the 11th of October, and nearly a week followed before the storm reached the coast near Miami. With this timely warning, it is sad, indeed, that loss of life should have resulted from the failure of the master of a vessel to heed the notice of the Weather Bureau that "caution was advised." We refer to the master of the schooner *Melrose*, bound from Jacksonville for the Bahamas, whose attention was called to the predicted storm. The master replied that he thought he could make the trip, and proceeded southward, running into, or near, the storm center. A wrecked vessel and the loss of five or six lives is the penalty he paid for ignoring the information issued by the Weather Bureau. It is painful to allude to such misfortunes, but it is, nevertheless, profitable to others, so that in the future such recklessness may be avoided. During the period of tropical storms sailing vessels should use every precaution. The Weather Bureau bases its warnings on scientific deductions, and generally with great accuracy, and it is criminal in any master to ignore them during the period of hurricanes. It is a case of everything to lose and nothing to gain.

The month was unusually dry. With the exception of the heavy rains that fell along the Atlantic coast, especially over southern Florida, during the prevalence of the stormy conditions attending the tropical disturbances of the 14th-19th, and 20th-21st, no rains of consequence fell in eastern and southern districts. The drought was especially severe in the east Gulf States, where no rain of importance has fallen since the early part of September.

#### NEW ENGLAND FORECAST DISTRICT.

A severe and general storm prevailed over the district on the 21st. It caused heavy winds and gales in all sections, with general rains ranging from moderate to excessive amounts. The gales along the coast greatly delayed and inconvenienced shipping and caused more or less damage, although so far as reported without loss of life. The storm resulted in much damage to telegraph and telephone wires throughout the cities and towns of New England, thereby delaying and preventing the transaction of business. In a number of instances plate glass windows and large signs were destroyed and fruit and shade trees damaged or blown down. At Auburndale,

Mass., a man was killed by the falling of a live wire, and at Worcester a boy was killed by a heavy gate. As the crops had been generally secured, the agricultural interests suffered little damage. Excepting the above-mentioned storm, the weather of the month was very pleasant and is generally classed by the voluntary observers and correspondents as "fair and cool."—*J. W. Smith, District Forecaster.*

#### NORTH-CENTRAL FORECAST DISTRICT.

While no storms passing across the Lakes during the month caused any disasters, yet there were four or five that gave high and more or less dangerous winds. On the 5th north-west warnings were displayed on the upper Lakes for a storm that developed in the Missouri Valley and moved northeast, closely followed by an extensive area of high pressure from the northwest. This storm had threatening characteristics, but very high winds did not develop. On the night of the 9th storm warnings were ordered displayed for a storm that moved across from the Dakotas. This storm had developed decided energy, but moved across the northern portion of the Lakes. The highest winds of the month attended this storm. On the 19th warnings were displayed for a storm that developed in the southwest and moved northeast, with increasing energy, across the Lake region. This storm lingered over the northern portion of the Lake region for several days, and northwest warnings were displayed on the 21st and over portions of the Lake region on the 22d, practically on account of the same storm. The last warnings for the month were displayed on the 24th for a storm that moved southeastward over Manitoba and crossed the northern portion of the Lake region. With the exception of these storms, remarkably fine weather prevailed, especially during the latter half of the month.—*H. J. Cox, Professor and District Forecaster.*

#### ROCKY MOUNTAIN FORECAST DISTRICT.

The month was marked by very fine weather throughout the district. Timely notice of frosts was given to such districts as still needed warnings, but none was issued after the 17th, the close of the crop season.—*F. H. Brandenburg, District Forecaster.*

#### SOUTH PACIFIC FORECAST DISTRICT.

The month as a whole was marked by unsettled weather, except in the last decade. At San Francisco more than twice the normal amount of rain fell, and in the San Joaquin Valley more than three inches fell, an unusually large amount for that section. On the morning of October 5 light thunderstorms occurred in the central portion of the State. Forecasts for showers were made on the mornings of the 5th, 6th, 7th, 8th, 9th, 10th, and 11th. These were verified. Unusually heavy rains occurred in the raisin district on October 5 and 6, accompanied by a thunderstorm. Ample warning was given to raisin growers, and where the warning was not heeded the loss was considerable. Southeast storm warnings were displayed on October 9 from San Francisco northward and continued on the 10th and 11th. These forecasts were made by Mr. George H. Willson, Local Forecaster, in the absence of the district forecaster. From the 14th to the 29th fair weather prevailed generally over the district with fresh northerly wind.

The rainfall in the southern part of California was comparatively light, the disturbances taking a northerly course. There was little or no frost during the month, and but a moderate amount of fog on the coast north of San Francisco. The close of the month was marked by a moderate disturbance, and southeast storm warnings were ordered at 7 p. m., October 29, from Point Reyes to Eureka, and lowered at noon October 30.—*Alexander G. McAdie, Professor and District Forecaster.*

#### NORTH PACIFIC FORECAST DISTRICT.

The month of October in the North Pacific Forecast District was a quiet one and no storms of unusual severity oc-

curred. Several minor disturbances, for which storm warnings were displayed, passed eastward near the international boundary line, but as a rule they did not cause winds greatly above the verifying velocities.

Severe frosts, harmful to tender vegetation, were of frequent occurrence in the more elevated portions of the district east of the Cascade Mountains, but in western Oregon and western Washington the temperature was quite mild and only light frosts occurred.—*A. B. Wollaber, Acting District Forecaster.*

#### WEST GULF FORECAST DISTRICT.

Unusually high temperatures prevailed over the district during the early part of the month, but toward the close of the month the temperature dropped below the normal. The first frost and freezing temperature of the season in the district occurred at Amarillo on the 19th, for which timely warnings had been issued. More general frosts occurred over the northern portion of the district on the 20th, 21st, 23d, 27th, and 28th, and warnings were issued for portions of the district for each of these dates. No severe storm visited the Gulf coast during the month, but high winds occurred on one or two dates, for which timely warnings were issued.—*I. M. Cline, District Forecaster.*

#### RIVERS AND FLOODS.

River conditions during October did not differ materially

from those of the preceding month. There was rather more water in the Mississippi River above the mouth of the Missouri, and somewhat less below. The Missouri, Ohio, and Tennessee were lower, and navigation on the latter remained practically at a standstill.

The crest of the Arkansas flood-wave of the latter part of September passed Wichita on the 8th, when the gage read 4.1 feet. The Canadian flood was the first to reach Fort Smith, the gage at that place reading 14 feet on the 6th. The wave from the upper Arkansas was of much less volume and added only about one foot to the water in the river when it arrived on the 12th.

Detailed reports of the floods of September in the Rio Grande Valley and the mountain districts of New Mexico and Colorado will be found in another part of this REVIEW.

The highest and lowest water, mean stage, and monthly range at 238 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor.*

### CLIMATE AND CROP SERVICE.

By Mr. JAMES BERRY, Chief of Climate and Crop Division.

The following summaries relating to the general weather and crop conditions during October are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau; they are based upon voluntary reports from meteorological observers and crop correspondents, of whom there are about 3000 and 14,000, respectively:

**Alabama.**—First two decades warm; last decade rather cold, with killing frost general in some districts, though too late to damage cotton, which was nearly all picked by close of month. Cotton yield generally about average, though slightly above in some localities. Much corn housed, yield good. Minor crops shortened by the drought, which began early in September and continued practically unbroken, and which interfered seriously with many industries. Some oats and wheat seeded.—*F. P. Chaffee.*

**Arizona.**—Weather generally dry, except in southeastern portion of the territory, but water was fairly plentiful for irrigation and stock. Temperatures averaged slightly below normal, but there was some quite cold weather in northern districts. Crops generally were too nearly matured to be materially injured by the cold weather. Plowing and seeding of grain were in progress during the month. Range feed was plentiful and well cured as hay, promising abundant winter feed. Stock was generally in fine condition.—*M. E. Blystone.*

**Arkansas.**—Temperature slightly above normal; rainfall deficient, with droughty conditions. Cotton opened rapidly; considerable progress made in gathering crop; picking completed in some sections, nearing completion in others; top crop light. Early corn garnered; late being gathered, almost a complete failure. Conditions unfavorable for fall plowing and seeding; very little done; less than usual acreage sown to small grains. Apples being gathered, yield light, quality fair. Stock not doing well on account of scarcity of water and poor condition of pastures.—*Edward B. Richards.*

**California.**—Heavy rains in the central and northern sections caused considerable damage to late grapes and slightly injured raisins and prunes on trays, although ample warnings were given. Beans and baled hay were also somewhat damaged. In other respects the early fall rains were of inestimable value, particularly to grass and early sown grain. The soil was in excellent condition, except in the south, and plowing and seeding were progressing. Oranges were coloring rapidly.—*G. H. Willson.*

**Colorado.**—Month favorable for ripening and harvesting of outstanding crops and fruit. Fall wheat and rye germinated well, but the acreage sown was below the average. Plowing was delayed in localities by the beet harvest, which was probably two-thirds finished by the close of the month. The crop was unusually good, both as to yield and quality.—*N. M. Cunningham.*

**Florida.**—The month was favorable for picking cotton, the bulk of which was housed. There was a marked deficiency in precipitation in western counties, where seeding for vegetables was retarded. Some small shipments of citrus fruits were made. The tropical storm over southern counties during the second decade damaged some citrus fruits and pineapples. Lowlands were flooded and vegetables were largely

ruined; much replanting will be necessary. The month averaged warmer and wetter than the normal.—*A. J. Mitchell.*

**Georgia.**—The drought continued during the month. Light showers fell on the 3d, 4th, 20th, and 26th. Growing crops seriously injured. Greatest scarcity of water for years; water hauled for stock and machinery. Little fall plowing. Seeded grain failed to germinate. Weather ideal for harvesting; cotton about gathered, staple fine, yield considerably above average. Corn harvesting nearing completion, yield excellent. Temperature about normal. Light frost general 16th, heavy in most sections, killing in north and central on the 23d and 24th.—*J. B. Marbury.*

**Idaho.**—The month was warmer than the average. Rain in the central and southern sections fell almost entirely from the 6th to the 16th, and in the northern sections from the 6th to the 19th, and on the 30th and 31st; the remainder of the month was bright and pleasant, enabling harvest of late fruits and other fall work to progress rapidly. The apple crop proved to be exceptionally heavy in some localities. Fall ranges were good.—*Edward L. Wells.*

**Illinois.**—Corn was practically safe in all districts before the coming of killing frosts on the 26-28th. Weather conditions were highly favorable for farm work and the maturing of corn. Considerable husking and cribbing had been done by end of month. General condition of wheat and pastures was quite satisfactory, but rain was needed in some localities. Potato output was above average. Fair apple crop of good quality was gathered in northern half, but light yield of inferior quality was indicated for southern counties.—*Wm. G. Burns.*

**Indiana.**—Generally killing frost did not occur until the last decade. Practically all corn matured without injury and cribbing began during the last week. Owing to droughty conditions in some southern counties wheat seeding was not entirely finished at the close of October, but generally the crop was up and growing nicely. Rye, clover, and pastures were in good condition. A fairly good crop of potatoes was secured. Apples were mostly gathered, with yield and quality below average. Tobacco was housed. An average crop of tomatoes was canned.—*W. T. Blythe.*

**Iowa.**—October was warmer and drier than usual. Conditions were favorable for maturing belated portion of corn crop and harvesting potatoes, apples, and vegetables. First general killing frost occurred on morning of 23d. Last decade was rainless and a fair start was made in cribbing corn, with yield above expectations. Pasturage was excellent. Fall wheat and rye made good growth. Fair progress was made in fall plowing.—*John R. Sage.*

**Kansas.**—Wheat made good progress during the month, and at its close was in fine condition, though in the southeastern and central-southern counties it was needing rain. Corn matured well and was being cribbed. Apples and potatoes were gathered and proved good crops. Range and pastures were good most of the month, and cattle were in good condition.—*T. B. Jennings.*

**Kentucky.**—Severe drought interfered with wheat seeding, and much of that sown failed to come up. Water for stock became very scarce, and in some localities it was difficult to get enough for household use. The weather was favorable for harvesting late crops. There was a killing